

School of Information Technology

Computer Science (ENG)

Level of Higher Education - Level I

Qualification to be Awarded – Bachelor of Computer Science

Language of Instruction – English

Number of ECTS credits - 240 ECTS

Programme Prerequisites:

Student enrolment in bachelor's programme is carried out in accordance with the rules established by Georgian legislation and is based on the results of the Unified National Examinations. Required:

- Passing the English language and Mathematics or/and Physics components
- In English, more than 70% + 1 point is required

Individuals, who have a complete general education qualification are eligible for enrolment in bachelor's programs. For foreign students, Alte University has developed a special enrollment procedure that meets international standards for evaluating applicants' academic qualifications.

Programme Objectives

6. Build a Solid Theoretical and Mathematical Foundation

Develop students' core knowledge in computer science principles, including algorithms, data structures, and mathematics essential for problem-solving and computational thinking.

7. Develop Practical Skills and Technical Competence

Equip students with hands-on experience in software development, information security, and computer engineering through applied learning, labs, and projects.

8. Support Personalized Learning and Specialization

Offer students flexibility to explore and specialize in their area of interest—software development, information security, or computer engineering —through guided orientation and elective pathways.

9. Promote Ethical, Responsible, and Collaborative Practice

Increase awareness of ethical, legal, and social issues in technology while fostering teamwork, communication, and professional responsibility.

10. Prepare Graduates for Global Careers and Lifelong Learning

Empower students with the skills, mindset, and adaptability needed for success in the international tech job market and ongoing professional development.

Structure of Educational Programme	
Mandatory courses	180 ECTS
Elective courses	60 ECTS
Supplementary programme ¹	-
Total	240 ECTS

Programme Learning Outcomes
<u>Knowledge and understanding</u>
Explains fundamental concepts in computer science, including programming, data structures, systems, databases, and networks.
Describes mathematical and logical methods, including calculus and discrete mathematics, for analyzing and solving computational problems.
Discusses the characteristics of specialized fields within computer science such as software development, information security, and computer engineering and their real-world applications.
<u>Skill</u>
5. Implements software solutions using modern programming tools and methodologies.
6. Analyzes and evaluates computational systems and technologies in terms of efficiency, scalability, and security.
7. Works effectively in diverse teams, applying collaboration, leadership, and project management skills in computing projects.

8. Solves real-world technical challenges and develops innovative digital solutions through critical thinking.
<u>Responsibility and autonomy</u>
4. Demonstrates ethical and socially responsible behavior in professional computing practice, including issues of data privacy and the responsible use of technology.
5. Engages in independent learning and professional development to keep pace with technological evolution.
6. Exhibits independence and accountability in both individual and collaborative activities, managing time and resources effectively.

Fields of employment
The Bachelor Program in Computer Science at Alte University prepares internationally competitive professionals with the skills and knowledge required to thrive in the rapidly evolving digital landscape. Graduates are equipped to address challenges related to modern technologies and contribute effectively across a range of industries. With a strong foundation in theoretical principles and hands-on experience in areas such as Software Development, Information Security, and Computer Engineering, graduates will be capable of fulfilling core professional roles in both private and public sector organizations—independently or as part of interdisciplinary teams. Typical career roles include: • Software Developer / Software Engineer • Information Technology Specialist • Network or Systems Administrator • Cybersecurity Analyst • Data Analyst / Machine Learning Engineer • Web Developer / DevOps Engineer • Embedded Systems or Hardware Engineer The program is uniquely enriched by its connection to Alte University's Innovation and Entrepreneurship Center, which supports students in developing entrepreneurial skills, launching startups, and applying their knowledge to real-world challenges. The center acts as a bridge between academia and industry, actively engaging with Georgia's dynamic startup ecosystem.

Moreover, Alte University maintains partnerships with **over 200 private sector organizations**, providing students with access to:

- Internship and employment opportunities
- Collaborative industry projects
- Innovation labs and career workshops
- Networking and mentoring from professionals

These partnerships significantly enhance graduate employability, offering pathways into both established companies and the innovation-driven startup sector—locally and internationally.

Additional information

For detailed information about the educational programme, please, visit the following link - <https://alte.edu.ge/ka/kompiuteruli-metsniereba-inglisurenovani-2>

№	Course title	Pre requisite	Credits	Hour	Distribution of Hours		Semester											
					Contact Hours	Independent Study Hours	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII

					Lecture	Practical Work	Midterm Exam	Final Exam	Total Contact Hours												
Mandatory courses of major study component																					
Mandatory courses of major study component (130 credits)																					
1	Introduction to Programming	N/A	5	3	1	2	3	3	48	77	x										
2	Fundamental of Computer Architecture and Technology History	N/A	5	3	1	2	3	3	48	77	x										
3	Information Tech	N/A	5	3	1	2	3	3	48	77	x										

	nologies																					
4	Object Oriented Programming	Introduction to Programming	5	3	1	2	3	3	48	77		x										
5	Web Development I (FrontEnd)	N/A	5	3	1	2	3	3	48	77		x										
6	Data Structures and Algorithms I	Object Oriented Programming	5	3	1	2	3	3	48	77			x									
7	Discrete Math	N/A	5	3	1	2	3	3	48	77			x									
8	Computer Organization and Architecture	Object-oriented programming, fundamentals of	5	3	1	2	3	3	48	77			x									

		computer architecture and history of technology																				
9	Web Development II (JavaScript)	Web Development I (FrontEnd)	5	3	1	2	3	3	48	77			x									
10	Data Structures and Algorithms II	Data Structures and Algorithms I	5	3	1	2	3	3	48	77				x								
11	Relational Databases	Linear Algebra, Discrete Math	5	3	1	2	3	3	48	77				x								
12	Fundamentals of systems	Computer Organization	5	3	1	2	3	3	48	77				x								

	admini- stration (Win- dows)	and Archi- tecture																				
13	Fun- damenta- ls of Net- work Com- munications	Computer Organization and Archi- tecture	5	3	1	2	3	3	48	77				x								
14	Program- ming Para- digms	Object Oriented Program- ming	5	3	1	2	3	3	48	77					x							
15	Theory of Computation	Linear Algebra, Discrete Math, Data Structures	5	3	1	2	3	3	48	77					x							

		and Algorithms II																				
16	NoSQL Databases	Relational Databases	5	3	1	2	3	3	48	77					x							
17	Introduction to Cyber security	Introduction to Programming, Data Structures and Algorithms II	5	3	1	2	3	3	48	77					x							
18	IT Career Management	N/A	5	3	1	2	3	3	48	77					x							
19	Data Analysis	Probability and Statistics, Data Structures	5	3	1	2	3	3	48	77						x						

		ture and algor ithms II																				
20	Artifi cisl Intelli gence	Linea r Alge bra, Discr ete Math , Data Struc tures and Algo rithm s II	5	3	1	2	3	3	48	77					x							
21	Data Engi neer ing	Relati onal Datab ases	5	3	1	2	3	3	48	77												
22	Mac hine Lear ning	Artif icial Intel igen ce	5	3	1	2	3	3	48	77						x						
23	Bach elor Proje ct	Aca demi c Writ ing	5	3	1	2	3	3	48	77							x					

24	Practice	all compulsory courses	5	3	1	2	3	3	48	77							x					
25	Bachelor Thesis	all compulsory courses	10	3	1	2	3	3	48	77								x				
Software Development - Mandatory Elective (40 credits)																						
1	Web Development - Flask	Introduction to Programming	5	3	1	2	3	3	48	77						x						
2	Graphic Design	N/A	5	3	1	2	3	3	48	77						x						
3	Programming Language Java	Object Oriented Programming	5	3	1	2	3	3	48	77						x						

4	Mobil e App Devel opme nt	Progr ammi ng Lang uage Java, Grap hic Desi gn	5	3	1	2	3	3	48	77							x					
5	React	Web Deve lopm ent II (Java Scrip t)	5	3	1	2	3	3	48	77							x					
6	Fund ament als of Softw are Testi ng	Web Deve lopm ent I (Fron tEnd) , Web Deve lopm ent II (Java Scrip t), Mobi le App Deve	5	3	1	2	3	3	48	77								x				

		lopment																				
7	IT Project Management	N/A	5	3	1	2	3	3	48	77								x				
8	Network Systems Engineering	Computer Organization and Architecture, Fundamentals of Network Communications	5	3	1	2	3	3	48	77								x				
	Information Security - Mandatory Elective (40 credits)																					
1	Operating Systems - Linux	Computer Organization	5	3	1	2	3	3	48	77						x						

		and Architectu re																				
2	Intrdo uctio n to crypt ograp hy	Fund ame ntals of Netw ork Com unica tions	5	3	1	2	3	3	48	77						x						
3	Cloud Comp uting	Fund ame ntals of syste ms admi nistr ation (Win dows)	5	3	1	2	3	3	48	77						x						
4	Netw ork Infras tructu re Admi nistra tion	Fund ame ntals of Netw ork Com	5	3	1	2	3	3	48	77							x					

		unications																				
5	Ethical Hacking	Operating Systems - Linux	5	3	1	2	3	3	48	77							X					
6	Software Engineering	Object Oriented Programming, Data Structures and Algorithms II	5	3	1	2	3	3	48	77								X				
7	DevOps	Data Analysis, Data Engineering	5	3	1	2	3	3	48	77								X				
8	Blockchain	Introduction to Cybersecurity,	5	3	1	2	3	3	48	77								X				

		Data Engi neeri ng																				
Computer Engineering - Mandatory Elective (40 credits)																						
1	Nume rical Meth ods	Calc ulus II	5	3	1	2	3	3	48	77						x						
2	Introd uctio n to Electr onics	Physi cs II	5	3	1	2	3	3	48	77						x						
3	Progr ammi ng Matla b	Intro ducti on to Progr ammi ng, Discr ete Math , Prob abilit y and Statis tic	5	3	1	2	3	3	48	77						x						
4	Discr ete Data	Data Anal ysis,	5	3	1	2	3	3	48	77							x					

	Processing in Matlab I	Numerical Methods																				
5	Introduction to Microprocessors	Introduction to Electronics, Computer Organization and Architecture	5	3	1	2	3	3	48	77							x					
6	Software Engineering	Object Oriented Programming, Data Structures and Algorithms II	5	3	1	2	3	3	48	77								x				

7	IoT - smart systems	Introduction to Microprocessors, Object Oriented Programming	5	3	1	2	3	3	48	77								x				
8	Discrete Data Processing in Matlab II	Discrete Data Processing in Matlab I	5	3	1	2	3	3	48	77								x				
Elective courses (0-20 credits)																						
5	Tech Entrepreneurship	N/A	5	3	1	2	3	3	48	77				x		x	x	x				
6	iOS Programming	Mobile App	5	3	1	2	3	3	48	77								x				

	min g	Dev elop men t																				
7	Soft ware Test Auto mati on	Fun dam enta ls of Soft war e Test ing	5	3	1	2	3	3	48	77							x	x				
8	Dro nes in envi ron men tal and agric ultur al scie nces	N/A	5	3	1	2	3	3	48	77				x		x	x	x				
9	Emb edde d Syst em	Obje ct- orie nted pro gra	5	3	1	2	3	3	48	77				x		x	x	x				

		mm ing																				
10	Prog rami ng Lang uage C#	Obje ct Orie nted Pro gra mm ing, Data Stru ctur es and Algo rith ms I	5	3	1	2	3	3	48	77				x		x	x	x				
11	Web Deve lop men t - Djan go	Intr odu ctio n to Pro gra mm ing	5	3	1	2	3	3	48	77				x		x	x	x				
12	Neur al Net wor ks	Mac hine Lear ning (Dee p	5	3	1	2	3	3	48	77				x		x	x	x				

		Lear ning)																				
13	Man age men t of infor mati on syst ems	Netw ork Infra struct ure Admi nistra tion	5	3	1	2	3	3	48	77				x		x	x	x				
Free Study Component (minimum 50-70 credits)																						
Compulsory courses of free study component (50 credits)																						
1	STE M	N/A	5	3	1	2	3	3	48	77	x											
2	Calc ulus I	STE M	5	3	1	2	3	3	48	77		x										
3	Phys ics I	STE M	5	3	1	2	3	3	48	77		x										
4	Line ar Alge bra	N/A	5	3	1	2	3	3	48	77		x										

5	Calculus II	Calculus I	5	3	1	2	3	3	48	77			x								
6	Physics II	Physics 1	5	3	1	2	3	3	48	77			x								
7	Probability and Statistics	Calculus II	5	3	1	2	3	3	48	77				x							
8	English I	N/A	5	4		4	3	3	62	63	x										
8	Academic Writing	N/A	5	2	1	1	3	3	34	91	x										
10	English II	English I	5	4		4	3	3	62	63		x									

Elective courses of free study component (0-20 credits)

1	Course(s) from other undergraduate programs offered at the University														x		x	x	x			
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Total Credits:

240

Note: From the 6th semester, one must choose one of the three offered elective blocks. The student can obtain the remaining 20 credits: from the remaining elective blocks and/or from the 10 offered elective courses and/or from the offered free elective components (including from other bachelor's programs operating at the university) subject to compliance with the relevant prerequisites. The student can also choose the desired courses of the main field of the bachelor's program in Artificial Intelligence and Data Analytics.